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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PROCTOR, JASON SCOTT

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/965,905

Applicant(s)

WALACAVAGE ET AL.

Examiner

Jason Proctor

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/28/2001</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-21 have been submitted for examination.
2. Claims 1-21 have been rejected.

Request for Status

3. The Examiner acknowledges Applicant's several requests for status of the instant application and regards this Office Action a sufficient response.

Priority

4. Applicant's request for priority under 35 U.S.C. § 119(e) to provisional application 60/236,964 filed on September 29, 2000 is acknowledged.

Double Patenting

5. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 09/965,904. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claim language of the copending application does not distinguish itself as defining an invention distinct from the invention of the instant application. The step of "constructing a part flow model" is a broader recitation of "constructing a flowchart of interaction of an operator in a workcell". The step of "determining whether the part flow model is acceptable" is equivalent to "testing whether logic of the flowchart is correct". The step of "using the part flow model to test

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PLC code to build a manufacturing line” is equivalent to “using the flowchart to test PLC code to build the workcell if the logic of the flowchart is correct”.

Although the first step, “constructing a part flow model”, is a broader recitation of the first step of the copending application, it would have been obvious to a person of ordinary skill in the art at the time of Applicant’s invention that a part flow model could include the interaction of an operator in a workcell, rendering claim 1 of the instant application unpatentable over claim 1 of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. § 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-21 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. MPEP 2105 reads as follows:

If the broadest reasonable interpretation of the claimed invention as a whole encompasses a human being, then a rejection under 35 U.S.C. 101 must be made indicating that the claimed invention is directed to nonstatutory subject matter. Furthermore, the claimed invention must be examined with regard to all issues pertinent to patentability, and any applicable rejections under 35 U.S.C. 102, 103, or 112 must also be made.

Claims 1-21 recite methods that are not directed to the technical arts. While the context of the methods is a programmable logic controller logical verification system, the methods of claims 1, 12, and 21 are directed toward creation and use of a part flow model. A reasonable interpretation of the term “part flow model” includes a diagram on

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paper, while the other recited steps of determining, using, and modifying could be performed by a human being. The inventions of claims 1-11, 12-20, and 21 are not limited to the technology arts, define a method that can be performed by a human being, and therefore nonstatutory.

8. MPEP 2106 reads as follows:

Courts have expressed a concern over "preemption" of ideas, laws of nature or natural phenomena. The concern over preemption was expressed as early as 1852. See *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132, 76 USPQ 280, 282 (1948) (combination of six species of bacteria held to be nonstatutory subject matter). The concern over preemption serves to bolster and justify the prohibition against the patenting of such subject matter. In fact, such concerns are only relevant to claiming a scientific truth or principle. Thus, a claim to an "abstract idea" is nonstatutory because it does not represent a practical application of the idea, not because it would preempt the idea.

Claims 1-21 recite methods that recite no tangible embodiment and are therefore abstract ideas. Limitations such as "constructing a part flow model" are merely suggestions that the vaguely defined concept of a "part flow model" will be manipulated. Claim 8, in particular, merely recites an attribute of the abstract concept of a "resource". Several claims recite steps of "selecting", however in the absence of a tangible embodiment for the methods, these steps must be interpreted as abstract human cognition. Where claims 12 and 21 refer to "playing the part flow model by a PLC logical verification system" and, by some interpretation, may therefore recite interaction with a tangible piece of technology, the methods do so by referring to the vaguely defined concept of a "part flow model". Claims 1-21 are therefore nonstatutory.

9. MPEP 2106 reads as follows:

Data structures not claimed as embodied in computer-readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Inasmuch as Applicant's invention may be computer software, none of claims 1-21 recite any structural or functional interrelationships between the claimed invention and a tangible computer component, such as a computer-readable medium. As a result, claims 1-21 are descriptive material *per se* and therefore nonstatutory.

To expedite a complete examination of the instant application the claims rejected under 35 U.S.C. § 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-21 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

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one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

12. Claim 1 recites the limitation "using the part flow model to test PLC code to build a manufacturing line" which has been rejected under 35 U.S.C. § 112, second paragraph, below and subsequently interpreted similarly to claims 12 and 21, which recite the limitation "using the tested PLC code to build a manufacturing line". This limitation is inadequately described by the disclosure. Although this phrase is suggested (page 13, lines 15-17), the disclosure is silent regarding PLC code that builds a manufacturing line. As is understood by the Examiner as known in the art, PLC code comprises instructions that direct the operation of a programmable logic controller, for example, to control the operation of a robot in a manufacturing production line. This limitation appears to refer to PLC code that somehow builds a manufacturing line. This functionality of PLC code is unknown to the Examiner, unknown in the art, and insufficiently described by the disclosure.

13. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 1-21 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

15. Claims 1 and 12 recite a step of "constructing a part flow model" which renders the claim vague and indefinite. The term "part flow model" could be reasonably

interpreted ranging from a flowchart drawn on a piece of paper to a multidimensional array in computer memory representing an abstract directed graph. As such, the step "constructing a part flow model" could be reasonably interpreted as a human drawing on a piece of paper, a computer system parsing a rules file defining a directed graph, a computer system initializing a data structure, among other interpretations. The Examiner notes that the specification states, "It should be appreciated that the part flow model is similar to a floor plan" (page 13, lines 17-20) but fails to indicate how, why, or what aspect of the part flow model is similar to a floor plan. It is unclear if this step is directed to the technology arts or rather a step to be performed by a human operator.

16. Claim 21 similarly recites a step of constructing a part flow model but further specifies selecting a part generator, generating a part, and moving the generated part, all of which renders the claim vague and indefinite. These limitations do nothing to clarify whether the part flow model is a flowchart drawn on paper, a particular data structure in computer memory, or some other construct that functions as a model. Additionally, it is unknown how the further limitations of this step achieve the stated goal of constructing a part flow model. Selecting a part generator, generating a part, and moving the generated part are completely unrelated to constructing a part flow model, to the best of the Examiner's understanding, unless the parts being generated are actual components of a tangible part flow model.

17. Claims 1, 12, and 21 all recite a step of "determining if the part flow model is acceptable" which renders these claims indefinite. The term "acceptable" indicates a level of tolerance and is therefore a relative term that is not defined by the claim, the

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specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unknown what tolerance for inaccuracy or incorrectness determines whether a part flow model is acceptable or unacceptable. Other uses of the term "acceptable" in claims 12 and 21 share this ambiguity.

18. Claim 1 concludes with the step "using the part flow model to test PLC code to build a manufacturing line" which renders the claim vague. The phrase is unclear and open to multiple interpretations. One interpretation is that the intended use of the PLC code is to build a manufacturing line. A second interpretation is that the part flow model is used to both test the PLC code and to build a manufacturing line. The phrase appears in the specification (page 4, lines 21-22) however the meaning is not clarified. It is unclear whether the result of this step is PLC code that has been tested or a manufacturing line that has been built.

19. Claims 12 and 21 include the step of "playing the part flow model by a PLC logical verification system" which renders these claims vague. It is unclear what is meant by playing by a logical verification system. It is unclear what is meant by the phrase "playing the part flow model" or how to perform such a step.

20. The rejections above under 35 U.S.C. § 112, first and second paragraph, applied to the independent claims 1, 12, and 21 are exemplary of the issues present in the dependent claims 2-11 and 13-20. The Examiner respectfully requests that Applicant

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carefully review all claims submitted for examination for compliance with 35 U.S.C. § 112.

Claims rejected but not specifically mentioned stand rejected by virtue of their dependence.

Claim Interpretation

21. In the interest of compact prosecution, examiner makes the following claim interpretations in order to apply prior art to the claims. See *Ex parte Ionescu*, 222 USPQ 537 (Bd. Pat. App. & Inter. 1984).

22. Regarding claim 1, the step "constructing a part flow model" is interpreted as "constructing a simulation of a part flow in a production line comprising one or more robots".

23. Regarding claim 1, the step of "determining if the part flow model is acceptable" is interpreted as "determining if the part flow represented in the simulation is correct".

24. Regarding claim 1, the step "using the part flow model to test PLC code to build a manufacturing line" is interpreted as "using the part flow simulation to test PLC code, and implementing a manufacturing line according to the part flow simulation".

25. Regarding claim 12, the step "constructing a part flow model" is interpreted as "constructing a simulation of a part flow in a production line comprising one or more robots".

26. Regarding claim 12, the step "playing the part flow model by a PLC logical verification system" is interpreted as "executing the simulation of part flow, wherein the simulation interacts with PLC logical verification system".

27. Regarding claim 12, the step of "determining if the part flow model is acceptable" is interpreted as "determining if the part flow represented in the simulation is correct".

28. Regarding claim 12, the step of "testing the PLC code if the part flow model is acceptable" is interpreted as "executing the part flow simulation, wherein the simulation interacts with the PLC logical verification system".

29. Regarding claim 12, the step of "using the tested PLC code to build a manufacturing line" is interpreted as "implementing a manufacturing line according to the part flow simulation".

30. Regarding claim 21, the step "constructing a part flow model by selecting a part generator, generating a part with the part generator, and moving the generated part to a location" is interpreted as "constructing a simulation of a part flow in a production line comprising one or more robots and a part generator, wherein the part generator generates a part and moves said part to a location".

31. Regarding claim 21, the step "playing the part flow model by a PLC logical verification system" is interpreted as "executing the simulation of part flow, wherein the simulation interacts with PLC logical verification system".

32. Regarding claim 21, the step of "determining if the part flow model is acceptable" is interpreted as "determining if the part flow represented in the simulation is correct".

33. Regarding claim 21, the step of “testing the PLC code if the part flow model is acceptable” is interpreted as “executing the part flow simulation, wherein the simulation interacts with the PLC logical verification system”.

34. Regarding claim 21, the step of “modifying the part flow model if the part flow model is not acceptable” is interpreted as “modifying the part flow represented in the simulation if the part flow is not correct”.

35. Regarding claim 21, the step of “using the tested PLC code to build a manufacturing line” is interpreted as “implementing a manufacturing line according to the part flow simulation”.

Claim Objections

36. Applicant is advised that should claim 1 be found allowable, claim 12 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. Applicant is advised that should claim 4 or claim 15 be found allowable, claim 21 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

37. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

38. Claims 1-21 are rejected under 35 U.S.C. § 102(b) as being anticipated by “Handbook of Simulation”, edited by Jerry Banks, hereafter referred to as *Banks*.

Regarding claims 1 and 12, *Banks* teaches an *entity* and a *resource* (§§ 1.3.3 and 1.3.4, page 7-8). An entity can serve other entities. An example is a bank teller, which provides standard banking services to other entities, namely customers. A resource is an entity that provides service to dynamic entities. In the language of claim 1, a part is a dynamic entity that moves through a system. The path of that movement is the *part flow* represented in the simulation. The PLC code and PLC verification system are resources that provide services to the part entity.

The step of determining whether the part flow represented in the simulation is regarded as a step performed by a human operator of the invention. Regardless, *Banks* teaches the steps of *verification* and *validation* (§ 1.7, steps 6 and 7, page 17). Verification is the step of confirming that the operational model performs properly. Validation is the step of determining that the model accurately represents the real system.

Regarding the step of implementing the manufacturing line, *Banks* teaches the step of *implementation* (§ 1.7, step 12, page 18).

Additionally, *Banks* specifically teaches that a simulation as described is suitable for application in areas such as “material flow analysis of automotive assembly plants” (§ 1.6.1, page 13).

Further regarding the limitations specific to claim 12, *Banks* teaches the step of executing the simulation (pages 35-36; Figure 2.4).

39. Regarding claims 2-8, *Banks* teaches the concept of *resources* (§ 1.3.4, pages 7-8). Resources are entities that provide service to other dynamic entities. *Banks* also teaches an example simulation where dynamic entities (Customers) are simulated arriving and moving through a model of a bank (Example 1 and Table 1.1, pages 4-5). In the language of claims 2-8, the part generator is a resource that models the arrival and flow of the part, which is a dynamic entity. The step of constructing a record for the part and the details thereof are yet another service provided to the dynamic entity part.

40. Regarding claims 9-11, *Banks* teaches several concepts related to the advantages of a simulation (§§ 1.5 and 1.5.1, pages 10-12). Included among these are correctly choosing the design of a system, specifically mentioning a materials handling system (page 10). *Banks* also teaches the concepts of *verification* and *validation* (§ 1.7, steps 6 and 7, page 17) that teach asking the question of whether the simulation accurately represent the real system. Implicit in this question is teaching the step of modifying the simulation if the simulation does not accurately represent the real system.

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41. The limitations of claims 13-20 correspond to the limitations of claims 2-8 and 10. As claim independent claim 12 has been rejected above under 35 U.S.C. 102(b) with the *Banks* reference, dependent claims 13-20 are rejected for the same reasons given for claims 2-8 and 10.

42. The limitations of claim 21 recite the combined limitations of claims 12-15 and 20. As claims 12-15 and 20 have all been rejected under 35 U.S.C. 102(b) with the *Banks* reference, claim 21 is rejected for the same reasons given above for claims 12-15 and 20.

Conclusion

Art considered pertinent by the examiner but not applied has been cited on form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin J Teska can be reached on (571) 272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

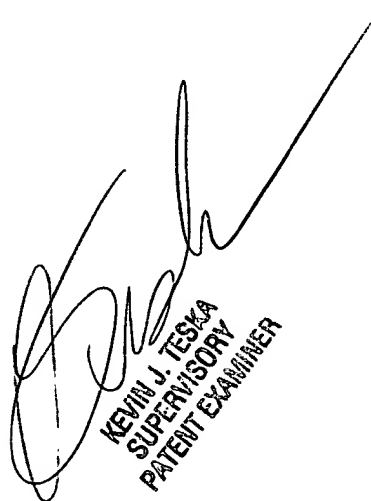
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jsp

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